

U.S. Patent Application Serial No. 10/809,924  
Amendment filed September 12, 2005  
Reply to OA dated March 11, 2005

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1           Claim 1 (currently amended): A high-temperature superconducting device comprising:  
2           a substrate, and  
3           a plurality of ramp-edge Josephson junctions having plural slopes in different directions  
4           formed on said substrate,  
5           wherein said plurality of ramp-edge Josephson junctions include at least two ramp-edge  
6           Josephson junctions having different critical current densities to one another ~~are provided on a~~  
7           ~~substrate,~~ in accordance with the direction of said slopes.

1           Claim 2 (original): The high-temperature superconducting device according to claim 1,  
2           wherein, among said Josephson junctions having different critical current densities, a Josephson  
3           junction having a relatively high critical current density forms a relatively high-speed operational  
4           circuit element, while a Josephson junction having a relatively low critical current density forms a  
5           relatively low-speed operational circuit element.

1           Claim 3 (original): The high-temperature superconducting device according to claim 2,  
2           wherein said relatively high-speed operational circuit element which includes said Josephson

3 junction having a relatively high critical current density is at least one of a pulse generator or a  
4 comparator.

1 Claim 4 (original): The high-temperature superconducting device according to claim 1,  
2 wherein said Josephson junctions having different critical current densities to one another form an  
3 interface-engineered barrier layer having different damages, or a barrier layer formed of deposited  
4 films having different thickness to one another.

1 Claim 5 (original): The high-temperature superconducting device according to claim 2,  
2 wherein said Josephson junctions having different critical current densities to one another form an  
3 interface-engineered barrier layer having different damages, or a barrier layer formed of deposited  
4 films having different thickness to one another.

1 Claim 6 (original): The high-temperature superconducting device according to claim 3,  
2 wherein said Josephson junctions having different critical current densities to one another form an  
3 interface-engineered barrier layer having different damages, or a barrier layer formed of deposited  
4 films having different thickness to one another.

1 Claim 7 (withdrawn): A manufacturing method of a high-temperature superconducting  
2 device, comprising the steps of: forming a ramp-edge structure having a plurality of slopes in a same

3 island region provided on a substrate; and

4 irradiating ion under such a condition that at least a damage to one of said slopes is different  
5 from a damage to other said slopes.

1 Claim 8 (withdrawn): The manufacturing method of a high-temperature superconducting  
2 device according to claim 7, comprising the step of irradiating ion from a specific diagonal direction  
3 under a condition that a substrate is not rotated with respect to said island region.

1 Claim 9 (withdrawn): A manufacturing method of a high-temperature superconducting  
2 device, comprising the steps of:

3 forming a ramp-edge structure having a plurality of slopes in a same island region provided  
4 on a substrate; and

5 depositing a barrier layer under a condition that at least a thickness of a deposited film over  
6 one of said slopes is different from that of a deposited film over other said slopes.

1 Claim 10 (withdrawn): The manufacturing method of a high-temperature superconducting  
2 device according to claim 9, comprising the step of depositing, from a specific diagonal direction  
3 and by a sputtering method, a material to form a barrier layer, under a condition that said substrate  
4 is not rotated with respect to said island region.

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